

Application No. 09/715,935

AMENDMENTS TO THE CLAIMS

A detailed listing of all claims that are, or were, in the present application, irrespective of whether the claim(s) remains under examination in the application are presented below. The claims are presented in ascending order and each includes one status identifier. Those claims not cancelled or withdrawn but amended by the current amendment utilize the following notations for amendment: 1. deleted matter is shown by strikethrough for six or more characters and double brackets for five or less characters; and 2. added matter is shown by underlining.

1.-17. (Canceled).

18. (Currently Amended) A method of coating a substrate, the method comprising:
reacting a reactant stream within a flow by directing a radiation beam at the reactant stream to produce within the flow a product stream comprising particles downstream from the radiation beam, wherein the particles are produced by the reaction, wherein the flow passes through the radiation beam, and wherein the reaction is driven by energy from the radiation beam;
directing the flow of the product stream to a substrate; and
moving the substrate relative to the flow of the product stream to coat the substrate.

19. (Original) The method of claim 18 wherein the radiation beam is generated by a light source.

20. (Original) The method of claim 18 wherein the radiation beam is generated by a laser.

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21. (Original) The method of claim 18 further comprising pumping on the reaction chamber to maintain flow through the reaction chamber.
22. (Original) The method of claim 18 wherein the reactant stream is elongated in a direction along the propagation of the radiation beam.
23. (Original) The method of claim 18 wherein the substrate is mounted on a stage that moves relative to a product stream.
24. (Original) The method of claim 23 wherein the reactant stream is elongated in a direction along the propagation of the radiation beam to produce a line of product particles that are simultaneously deposited on the substrate and wherein relative movement of the stage sweeps the line across the substrate.
25. (Original) The method of claim 23 further comprising moving the substrate from the path of the reactant stream and placing another substrate in the path of the product stream.
26. (Original) The method of claim 18 wherein the reactant stream is elongated and wherein a line of light propagates to intersect the elongated reactant stream.
27. (Original) The method of claim 18 wherein the reactant inlet moves relative to the substrate such that motion of the reactant inlet sweeps the product particles across the substrate.

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28. (Original) The method of claim 18 wherein the product stream passes through a conduit prior to reaching the substrate and wherein the conduit moves relative to the substrate with motion of the conduit sweeping the product particles across the substrate.
29. (Original) The method of claim 18 wherein an external field is applied to direct the product stream.
30. (Original) A method of forming a glass coating comprising heating a particle coating at a temperature and for a period of time sufficient to fuse the particles into a glass and where the particle coating is formed according to the method of claim 18.
31. (Original) A method of forming an optical component on a substrate surface, the method comprising removing a portion of a glass coating formed according to the method of claim 30 to form the optical component.
32. (Original) The method of claim 31 wherein the removing of a portion of the glass coating is performed by photolithography.
33. (Previously Presented) A method of coating a substrate comprising:
generating, within a flow, a reactant stream with a cross section perpendicular to the propagation direction characterized by a major axis and a minor axis, the major axis being at least a factor of two greater than the minor axis;
reacting the reactant stream to form a product stream of particles within the flow;
and

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directing the flow of the product stream of particles to a substrate, wherein flow of the product stream is maintained other than by pumping on the substrate.

34. (Original) The method of claim 33 wherein at least about 25 grams per hour are deposited onto the substrate.

35. (Original) The method of claim 33 wherein the reaction is driven by a light beam.

36. (Original) The method of claim 33 wherein the major axis is at least a factor of ten greater than the minor axis.

37. (Original) The method of claim 33 wherein the flow of the stream of particles is maintained by momentum of the product stream.

38. (Original) The method of claim 33 wherein the flow of the stream of particles is maintained by pumping out a chamber and wherein the substrate is located within the chamber.

39. (Previously Presented) A method of coating a substrate having a diameter greater than about 5 cm, the method comprising:

reacting, within a flow, a reactant stream to form, within the flow, a product stream comprising product particles, wherein the particles are produced by the reaction; and

depositing simultaneously particles from the flow of the product stream over the entire surface of the substrate and wherein at least about 5 grams per hour of

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particles are deposited onto the substrate, wherein flow of the product stream is maintained other than by pumping on the substrate.

40. (Original) The method of claim 39 wherein the product stream of particles is defocused with an external field.
41. (Original) The method of claim 40 wherein the external field is generated by thermal gradient generator or an electric field generator.
42. (Previously Presented) A method of coating a substrate comprising:
simultaneously generating multiple product streams each within a corresponding flow of a reactant stream by chemical reaction driven by a light beam; and depositing the multiple product streams simultaneously on a moving substrate at sequential locations on the substrate.
43. (Previously Presented) The method of claim 18 wherein the reactant stream comprises a silicon precursor.
44. (Previously Presented) The method of claim 18 wherein the reactant stream comprises a metal precursor.
45. (Previously Presented) The method of claim 33 wherein the reactant stream comprises a silicon precursor.

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46. (Previously Presented) The method of claim 33 wherein the reactant stream comprises a metal precursor.

47. (Previously Presented) The method of claim 35 wherein the light beam comprises infrared light.

48. (Previously Presented) The method of claim 33 wherein the substrate is moved relative to the product stream while directing the stream of particles to the substrate to coat different portions of the substrate.

49. (Previously Presented) The method of claim 33 wherein the substrate is moved relative to the product stream while directing the stream of particles to the substrate to coat the surface of the substrate in one pass of the substrate through the product stream.

50. (Previously Presented) The method of claim 39 wherein at least about 25 grams per hour are deposited onto the substrate.

51. (Previously Presented) The method of claim 39 wherein the reaction is driven by energy from a radiation beam.

52. (Previously Presented) The method of claim 39 wherein the reactant stream comprises a silicon precursor.

53. (Previously Presented) The method of claim 42 wherein at least two of the multiple product streams comprise product particles with the same composition.

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54. (Previously Presented) The method of claim 42 wherein at least one of the multiple product streams comprise product particles with a different composition from product particle in another of the multiple product streams.

55. (Canceled)

56. (Previously Presented) The method of claim 61 wherein the reaction is driven by energy from a radiation beam.

57. (Previously Presented) The method of claim 61 wherein the reactant stream has a cross section perpendicular to the propagation direction characterized by a major axis and a minor axis, the major axis being at least about a factor of two greater than the minor axis.

58. (Previously Presented) The method of claim 61 wherein the reactant stream comprises a silicon precursor.

59. (Previously Presented) The method of claim 61 wherein the substrate is moved relative to the product stream while directing the stream of particles to the substrate.

60. (Previously Presented) The method of claim 61 wherein the directing of the product stream to the substrate deposits at least about 25 grams per hour onto the substrate.

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61. (Previously Presented) A method of coating a surface of a substrate, the method comprising:

reacting, within a flow, a reactant stream to produce, within the flow, a product stream comprising particles wherein the particles are produced by the reaction;

directing the flow of the product stream to the substrate, wherein the substrate does not permit gas to pass through; and

moving the substrate relative to the flow of the product stream to deposit at least about 5 grams per hour onto the substrate surface.